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The Archipolypoda of the Mazon creek nodules have stout forked spines and two pairs of legs to each segment. Palæocampa may therefore be considered as a precursor of the Chilopoda, just as the Archipolypoda are the precursors of the Diplopoda, and the discovery of these types prove that at this early period the divergencies of structure among myriapods were as great as they are to-day.——In the same journal Messrs. McGee and Call write upon the Loess of Des Moines, Iowa, giving faunal tables of the fossils, which have a less aquatic facies than the modern mollusca of the same district.——Messrs. Scott and Osborn describe *Orthocynodon*, an ancestor of the Rhinoceros, from the Bridger Beds of Wyoming. It is the oldest known representative of the line, and differs from Amynodon in the erect lower canines, similarity of premolars and molars and other particulars. He has little of the rhinocerotic character in the skull, but the possession of canines and loss of the median incisors point it out as related to Amynodon.

MINERALOGY.[1]

THE ACTION OF HEAT UPON CRYSTALS OF BORACITE.—Mallard contributes to the Mineralogical Society of France an interesting paper upon the change which heat produces in the optical properties of boracite. The leading mineralogists of Germany—Klein, Zirkel, Groth, etc., hold that such changes are due simply to unequal internal tension, such as may be produced in glass. That the biaxial character caused by heat is an essential and characteristic character of boracite, due to the twinning of twelve rhombic crystals around a point, is again strongly urged by Mallard in the present paper. He supposes each individual of the *pseudo-symmetrical* crystal to be a pyramid whose base forms a face of the external dodecahedron, and whose summit is at the center of the crystal. By cutting sections in various directions through the crystal, and examining them optically both before and after heating, he shows that there are persistent optical properties which cannot be explained by irregular tension. He concludes that by the action of an intense and prolonged heat, a series of very thin plates are formed, alternately twinned with each other according to a definite crystallographic law. He shows that analogous phenomena may be produced by the action of heat upon sulphate of potash, and that such invariable phenomena could not be produced by tension or pressure in a colloid substance.

PREHNITE.—This zeolite, so frequent in rocks of igneous origin, and recently found to so frequently exhibit curious optical properties, has been carefully described by Professor B. K. Emerson in its associations and alterations in the Deerfield Dike of Connecticut. Prehnite is regarded as the oldest mineral in the veins in which it appears. Frequently the motion of the rock walls produces slickensides upon the prehnite, and sometimes breaks it up into sheets, which are re-cemented by prehnite. The prehnite often encloses diabantite, and then varies in color from deep oil-green to jet-black. This black prehnite is sometimes combed out by the slipping rock into long fibres, resembling hornblende or chrysotile. The prehnite also occurs as a finely crystallized double cone or spindle, forming beautiful specimens. This peculiar form is the result of the twinning of three individuals around a common axis, and the resulting optical properties are peculiar. Prehnite also occurs in amydaloidal cavities which are blackened as though held in the flame of a candle. A black substance covers the fibres of prehnite, looking like a net-work of soot-covered cobwebs. This black substance is the result of alteration, and is probably chlorophæite. In other cases the prehnite has changed into a pale-green scaly mass, which appears to be diabantite.

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[1] Edited by Professor H. CARVILL LEWIS, Academy of Natural Sciences, Philadelphia, to whom communications, papers for review, etc., should be sent.

AMERICAN MONAZITES.—In the *American Journal of Science* for October, Professor E. S. Dana and Mr. S. L. Penfield contribute valuable articles upon American monazites. From a careful measurement of a small monazite crystal from Alexander county, North Carolina, by Professor E S. Dana, the following axial ratio was obtained:

$$c \text{ (vert)} : b : \grave{a} = 0.95484 : 1.03163 : 1$$
$$\beta = 76° 20'$$

A table is given containing a list of the more important angles calculated from these data, and agreeing closely with the results of goniometrical measurement. The axial ratio is closely related to that of monazites from other localities.

Mr. Penfield has analyzed the monazites from Portland, Ct., from Burke county, N. C., and from Amelia county, Va. The latter is the substance originally thought to be an altered microlite. Each analysis showed a considerable percentage of thoria, there being over fourteen per cent. in the monazite from Amelia county, Va. In each case, if the thoria is omitted from the analysis, the ratio is obtained of $(Ce, La, Di)_2 O_3 : P_2 O_5 = 1 : 1$, this being the ratio of a normal phosphate of the cerium metals, $R_2 P_2 O_8$. Moreover, there is just sufficient silica in each analysis to make a thorium silicate. Since, therefore, some monazites contain no thoria, and the thoria is here present in varying amount, it is probable that thorium silicate exists as an impurity. That this is indeed the case was proved by examination of a thin section of the mineral under the microscope. A dark resinous substance was seen scattered through the section, and when the latter was moistened with hydrochloric acid, white blotches, composed of gelatinous silica took the place of the resinous spots, the rest of the section being unchanged. It is evident, therefore, that the thorium silicate is a foreign admixture in the monazite. It probably exists as thorite or orangite.

MINERALS FROM PIKE'S PEAK.—Pike's Peak has already become famous for the number and beauty of the mineral species in its vicinity. Besides the extraordinary specimens of amazon-stone (microcline) from that locality, there have been found smoky quartz, albite, fluorite, biotite, siderophyllite, columbite, gothite, arfvedsonite, astrophyllite, zircon, limonite pseudomorphs, etc. Most of these occur in cavities in granite. Recently Messrs. W. Cross and W. F. Hillebrand have added several species, new to this locality. Several crystals of colorless or pale greenish *topaz* were found, one specimen being a fragment, which must have belonged to a crystal a foot in diameter. Two imperfect crystals of *phenacite* were found, this being the first locality known in the United States. *Cryolite*, *thomsenolite* and several undetermined species were also found.

MINERALOGICAL NOTES.—The *volcanic ash* ejected from Vesuvius during the eruption of February 25, 1882, has been analyzed by Ricciardi. The ash was black and magnetic. When heated, it gave off hydrochloric acid. It contained particles of magnetite and awgite, and numerous crystals of leucite. As shown by analysis, it also contained a small percentage of apatite. Sulphate and chloride of ammonium were also present, and could be dissolved out by water.

Mountain cork has been recently used in Germany as a substitute for animal charcoal for the removal of color from molasses. The mountain cork, a variety of amphibole, is dried, ignited and soaked in molasses, then again dried and ignited. This process is repeated several times until some 3.5 per cent. of carbon has become fixed in the mineral, which is then ready for use. It is more efficient than charcoal in removing the alkalies from molasses.

GEOGRAPHY AND TRAVELS.[1]

DE BRAZZA'S EXPLORATIONS ON THE OGOWE AND THE CONGO.—At a recent meeting of the Geographical Society of Paris, M. Savorgnan de Brazza described his recent journeys in the territory between the Ogowé and Congo Rivers, of which, previously, few details had been known. He was directed by the French Government to trace the Alima River, discovered by him on his first expedition (1875–8), to its junction with the Congo and to establish stations on the Ogowé and the Congo.

M. de Brazza left France in December, 1879, ascended the Ogowé, and succeeded in negotiating with the tribes on its banks and establishing a regular system of transport on the river. He founded his first station, Franceville, at the confluence of the Passa with the Ogowé. From here in June, 1880, he dispatched 770 natives in 44 canoes to meet his coadjutor, Dr. Ballay, at the coast, and then started alone, with a small party of natives, for the Congo.

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[1] Edited by ELLIS H. YARNALL, Philadelphia.